



**UNITED STATES DEPARTMENT OF COMMERCE**  
**Patent and Trademark Office**

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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. |
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09/503,638 02/14/00 PRALL

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EXAMINER

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ART UNIT

PAPER NUMBER

2814

DATE MAILED: 09/07/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

## Office Action Summary

Application No.

09/503,638

Applicant(s)

PRALL et al.

Examiner

Ginette Peralta

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 23-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 23-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2,5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

*Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 23-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katayama (U. S. Pat. 5,444,278) in view of Prall et al. (U. S. Pat. 5,345,104).

Katayama teaches in Figs. 12, 13, 22, 35, and 37 a semiconductor memory device which comprises a silicon structure (1, 81) having a first conductivity type, a gate electrode (6, 86) over the silicon structure, a capacitor contact region in the silicon structure adjacent to one side of the gate electrode, a bit line contact region in the silicon structure adjacent to the other side of the gate electrode, a first dopant implant (3a, 3b, 83a, 83b) in the capacitor and bit line contact regions, the first dopant having a second conductivity type opposite the first conductivity type, a second dopant concentration in only the capacitor contact region, insulating spacers formed by layer 27 extending vertically along the sidewalls of the gate electrode and horizontally over a portion of the first dopant implant in the capacitor and bit line contact regions, a capacitor first conductor (9, 29, 92) in electrical contact with the capacitor contact region, a dielectric (10, 30, 93), and a capacitor second conductor (11, 31, 94) over the dielectric, wherein the

second dopant concentration is deeper than the first dopant implant, wherein the first dopant implant is implanted at a dosage of about  $10^{13}$  ions/cm<sup>2</sup> at an implantation energy of 50 KeV (Col. 12, lines 19-21), and the capacitor first conductor comprises polysilicon doped to the second conductivity type with a dosage of  $4-8 \times 10^{20}$  ions/cm<sup>2</sup>.

Katayama teaches all the limitations in the claims with the exception of a second dopant implant, although dopants are introduced a second time only to the capacitor contact region.

Prall et al. teaches a semiconductor device in which the contact regions are selectively implanted in which one of the regions, the source region is implanted twice, while the drain region is only implanted once for the purpose of reducing the drain voltage during programming.

Thus, it would have been obvious to one of ordinary skill in the art to introduce the second dopant concentration by diffusion as Katayama teaches or by a second implantation step as Prall et al. teaches for the disclosed intended purpose of reducing the drain voltage during programming and therefore obtaining a device having two contact regions with different dopant concentrations.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ginette Peralta whose telephone number is (703)305-7722. The examiner can normally be reached on Monday to Friday 8:00 AM-4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (703)306-2794. The fax phone numbers


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for the organization where this application or proceeding is assigned are (703)308-7722  
for regular communications and (703)308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or  
proceeding should be directed to the receptionist whose telephone number is (703)308-  
0956.

GP  
August 24, 2001

  
OLIK CHAUDHURI  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800